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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/115,331	07/14/1998	THOMAS MOSSBERG	EWG-063-C	1260

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EXAMINER	
CHANG, AUDREY Y	

ART UNIT	PAPER NUMBER
2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

AL

Office Action Summary	Application No.	Applicant(s)	
	09/115,331	MOSSBERG ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *56-71* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *56-71* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of species (B) claims 56-62 and 63-71 in the reply filed on January 24, 2005 is acknowledged.

2. This Office Action is also in response to applicant's amendment filed on January 24, 2005, which has been entered into the file.

3. By this amendment, the applicant has canceled non-elected claims 48-55 and 72-82.

4. Claims 56-71 remain pending in this application.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features concerning the *first and second sub-gratings on the substrate, being parallel and with non-zero separation distance*, (as recited in claims 56 and 63), the feature concerning the *first and the second sub-grating being overlap*, (as recited in claims 58 and 66), the *substrate being planar* (as recited in claims 59 and 67), and the *substrate being non-planar* (as recited in claims 60 and 68) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be

necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claims Objections

6. **Claims 56-71 are objected to because of the following informalities**:

(1). The phrase "a second sub-grating formed on the substrate *parallel* to the first sub-grating" recited in claims 56 and 63 is confusing and indefinite since it is not clear *what* feature of the sub-gratings are *parallel* to each other. It is not clear if it is the *grating lines* that are parallel to each other or the physical sub-grating *structure* as a whole or other property of the sub-gratings that are parallel to each other.

(2). The phrase "the first sub-grating and second sub-grating *overlap*" recited in claims 58 and 66 is confusing. It is not clear why would the two sub-gratings *overlap* with each other and *being parallel to each other*, in particularly if the grating lines of the two sub-gratings are parallel to each other, yet that the two sub-gratings do not *interfere* with each other. The periodicity in the region of overlap will certainly be massed up by the overlapping. Does this mean in the overlapping region a *third* sub-grating with yet *third grating period* is resulted?

(3). Claims 60 and 68 recite that the substrate is being *non-planar*, it is then not clear how could the two sub-gratings formed on the *non-planar substrate* is capable of being parallel to each other?

(4). The phrase "first segmented diffraction" recited in claim 63 believes to be in error.

(5). The phrase "the same construction" recited in claim 63 is confusing and vague since it is not clear the so-called "*same construction*" is referred to what exactly, and it is not clear to what degree the first and the second segmented diffraction gratings are considered to be "the same".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 56-57, 59, and 62 are rejected under 35 U.S.C. 102(e) as being anticipated by the patent issued to Welch et al (PN. 5,392,308).**

Welch et al teaches an *amplifier chip* (52, Figure 4), having a *substrate* and a first and a second DBR *grating segments* serve as the *sub-gratings* (58-1 and 58-2) formed on the substrate that are *parallel* to each other both in the sense of grating lines and of the grating structure as a whole. **Welch** et al teaches that each of the sub-gratings is designed to *reflect* a particular wavelength that is different from each other and this *implicitly* means the *grating period* for each of the sub-gratings is *different* from each other. Welch et al further teaches that the sub-gratings are *separated with a non-zero distance* that is *positive* in value, (with respect to claim 57). With regard to claims 59, the substrate is a *planar* substrate,

(please see Figure 4). With regard to claim 62, these sub-gratings are *reflective* gratings, (please see Figure 4, column 6, lines 16-38).

This reference has therefore anticipated the claims.

9. Claims 56-57, 59, and 61 are rejected under 35 U.S.C. 102(e) as being anticipated by the patent issued to Hong (PN. 5,315,423).

Hong teaches a *two-dimensional wavelength multiplexed image transmission device* that includes a *two-dimensional spectral disperser* (22, in Figure 2 or 30 in Figure 3) having a *substrate* and a *first and a second grating cells* serve as the *sub-gratings* (any two of elements 35-37, 39-41 and 43-45, in Figure 3) formed on the *substrate* that are *parallel* to each other both in the sense of grating lines and of the grating structure as a whole. **Hong** teaches that each of the sub-gratings is designed to *transmit* a particular wavelength that is different from each other and this implicitly means the *grating period* for each of the sub-gratings is *different* from each other. Hong further teaches that the sub-gratings are *separated with a non-zero distance* that is positive in value, (with respect to claim 57). With regard to claims 59, the substrate is a *planar* substrate, (please see Figure 4). With regard to claim 61, these sub-gratings are *transmission* gratings, (please see Figures 2-3 and column 3, lines 24-41).

This reference has therefore anticipated the claims.

10. Claims 56 and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Hettrick (PN. 4,798,446).

Hettrick teaches a *diffraction grating device* having series of *grating grooves* formed on a *non-planar substrate*, (please see Figures 1-2, and 6-10), wherein the *grating groove lines* are substantially *parallel* to each other. As demonstrated by Figures 2 and 6-10, the diffraction property of the grating lines located *at two ends* of the non-planar substrate are different. This means one can identify the groups

of the grating lines on the two ends of the substrate as two sub-gratings with *different grating periods* and being *separated from the each other* with a non-zero distance).

This reference has therefore anticipated the claims.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hong in view of the patent issued to Pieuchard et al (PN. 3,721,487).

The *two-dimensional spectral disperser having a plurality of sub-gratings* taught by Hong as described fro claim 56 above has met all the limitations of the claims. This reference however does not each explicitly that the sub-gratings overlap each other. Arranging sub-gratings in overlapping fashion, as long as the sub-gratings do not interfering each other is quite well known in the art as demonstrated by the teachings of **Pieuchard** et al wherein sub-gratings R1, R2 and R3, (Figure 4) are placed in overlapping fashion. It would then have been obvious to one skilled in the art to place the sub-gratings of Hong in overlapping fashion for the benefit of reduce the space and size of the substrate and the grating device needed.

13. **Claims 63-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hong.**

Hong teaches a *wavelength multiplexed two dimensional image transmission device* that is comprised of a *light source* (21, Figure 2 and 4) serves as *the optical carrier source* for generating *a first and second optical carriers (after* being splitting by the grating cells of 34, 38 and 42, Figure 3) and a *two-dimensional spectral dispenser* (22, Figure 2 or 30 in Figure 3) serves as the *first segmented diffraction grating*, wherein the two-dimensional spectral dispenser comprises a *substrate* and a first and a second grating cells serve as the *sub-gratings* (any two of elements 35-37, 39-41 and 43-45, in Figure 3) formed on the substrate that are *parallel* to each other both in the sense of grating lines and of grating structure as a whole. **Hong** teaches that each of the sub-gratings is designed to *transmit* a particular wavelength that are different from each other and this implicitly means the *grating period* for each of the sub-gratings are *different* from each other. Hong teaches that the sub-gratings are *separated with a non-zero distance* that is positive in value, (with respect to claim 65). Hong further teaches that the two-dimensional spectral dispenser is *coupled* to a *spatial light modulator* (23) for modulating the data signals contained in the optical carriers generated from the light source. The device further comprises a *two-dimensional spectral recombiner* (24), serves as the *second segmented diffraction grating* and it is *coupled* to *an optical fiber* (25, Figures 2 and 4), serves as the *optical transport*. Hong teaches that two-dimensional spectral recombiner (24) or the second segmented diffraction grating has the *same construction* as the first segmented diffraction grating (or the two-dimensional spectral dispenser), namely it is comprised of a plurality of *sub-gratings or cells* that are formed *on a substrate* and are *parallel* to each other with a *non-zero distance of separation from each other*, (please see Figure 4).

This reference has met all the limitations of the claims with the exception that is does not teach to explicitly having a first and second detector coupled to the second segmented diffraction grating. However this reference does teach to have another two-dimensional spectral dispenser coupled to the optical fiber and the dispenser has a plurality of means to receive the signal transmitted by the optical fiber. These receiving means can be broadly viewed as the first and second detectors. It would also have

been obvious to one skilled in the art to include a first and second detectors coupled to the optical fiber for the benefit of receiving and detecting the image information transmitted through the device.

This reference also does not teach to have a first and second modulator, however the spatial light modulator in the device does serve the purpose as of the first and second modulator for *modulating the data signal in the optical carriers generated by the light source*. To have a single modulator or have two modulators would therefore only make design difference and it would have been obvious matters of design choice to one skilled in the art to use two modulators for the benefit of making the device fitted for different application that requires two modulators for modulating the data signals.

With regard to claim 64, Hong teaches that the first column of the sub-gratings (34, 38 and 42 as shown in Figures 3 and 4) serves as the *beam splitter*. Although this beam splitter is not "comprised of the optical carrier source", however since the beam splitter achieves the same function of splitting up optical carrier into multiple optical carriers to have it at the source or not do not change its function and such modification would therefore considered to be obvious to one skilled in the art for the benefit of making different design that fitted for different specific requirement of specific application.

With regard to claim 65, the distance separation between the sub-gratings is positive non-zero value, (please see Figures 3 and 4). **With regard to claim 66,** this reference does not teach explicitly that the separation distance may also be negative non-zero value or the sub-gratings overlap with each other. However it is implicitly true that to have these sub-gratings separated from each other or overlapped with each other does not change the operation, and it is known in the art to make gratings overlapping with each other as long as they do not interfere with each other. It would then have been obvious to one skilled in the art to make the sub-gratings overlap with each other for the benefit of making the device with more compact size.

With regard to claims 67, the substrate is planar, (please see Figures 3 and 4). **With regard to claim 68,** this reference however does not teach *explicitly* that the substrate may also be of non-planar.

However the specification fails to provide the criticality of having the substrate being non-planar would overcome any problem of a planar substrate, and it is implicitly true that the shape of the substrate really does not affect the operation of the device, such modification would therefore have been considered as an obvious design choice to one skilled in the art for the benefit of making the segmented diffraction gratings with a geometric shape that better fits the specific design and requirement of a specific application.

With regard to claims 69-70, the sub-gratings are *transmission* gratings. Although this reference does not teach explicitly that the sub-gratings may also be of reflective gratings, (with regard to claim 70), such modification would have been obvious to one skilled in the art for the benefit of making the image transmission device in a reflective mode for the benefit of reducing the size of the device.

With regard to claim 71, Hong teaches to use as optical fiber as the optical transport for transferring the image signal.

Contact Information

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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